TEJUS
CONSULTANTS

Project	**Improvements to Roads and Drains in Agrahara, Agrahara Layout And Surrounding Area in Ward no 5.**
Client	**Bruhat Bengaluru Mahanagara Palike**
Consultant	**TEJUS CONSULTANTS Basaveshwar Nagar Bangalore**
Contractor	**Sri.T K SHANKARAPPA (MESPC INFRA PROJECTS PRIVATE LIMITED)**

Field Dry Density test by Sand Replacement Method (As per IS 2720 (Part 28)

	Date:	**18-03-2019**
Layer no. or level	WMM I layer	
Depth of hole	250mm	
Field density:	1	2
Wt. of wet material from hole (Ww) gms.	6150	6215
Wt. of sand+cylinder before pouring (w1) gms.	14000	14000
Wt. of sand+cylinder after pouring (w2) gms.	9714	9700
Wt. of sand in cone (w3) gms.	855	850
Wt. of sand in hole (w4)=(w1-w2-w3) gms.	3431	3450
Bulk density of sand (γs)gm/cc	1.32	1.31
Bulk density of material(i.e. wt. of the wet material) (γb)=(Ww/w4*(γs))gm/cc	2.37	2.36
Moisture meter reading(moisture content)	12.20	12.20
Result		
FDD(Wt.of the dry material)=(100γb/100+mc)gm/cc	2.11	2.10
MDD	2.14	2.14
OMC	13.50%	13.50%
%compaction obtained	98.54	98.28
%compaction required	98%	98%

TEJUS CONSULTANTS

Consultant's Representative

TEJUS
CONSULTANTS

Name of Work	:	Improvements to Roads and Drains in Agrahara, Agrahara Layout And Surrounding Area in Ward no 5.
Client	:	Bruhat Bengaluru Mahanagara Palike
Consultant	:	TEJUS CONSULTANTS Basaveshwar Nagar Bangalore
Contractor	:	Sri.T K SHANKARAPPA (MESPC INFRA PROJECTS PRIVATE LIMITED)
Date of Testing	:	18-03-2019
Type of Mix	:	WMM
Sample ID	:	WMM 2

GRADATION FOR WMM
(As per MORT&H 400-11)

Sample Location:	At plant	**Date of Sampling:**	18-03-2019
		Date of testing:	18-03-2019
Type of material & Purpose:	WMM	**Oven Dry Wt.(gms):**	10000.0

IS Sieve size in mm	Weight retained	Cummulative weight retained (gm)	Cummulative % of retained	Cummulative % of passing	Specification limits
53	0	0	0.00	100.00	100.00
45	345	345	3.45	96.55	95-100
22.4	2610	2955	29.55	70.45	60-80
11.2	2530	5485	54.85	45.15	40-60
4.75	1555.0	7040	70.40	29.60	25-40
2.36	965.0	8005	80.05	19.95	15-30
0.6	720.0	8725	87.25	12.75	8.0-22.0
0.075	670.0	9395	93.95	6.05	0-8
Pan	605.0	10000			
Total	10000.0				

Consultant's Representative

TEJUS CONSULTANTS

TEJUS
CONSULTANTS

Project:	Improvements to Roads and Drains in Agrahara, Agrahara Layout And Surrounding Area in Ward no.5.
Client:	Bruhat Bengaluru Mahanagara Palike
Consultant:	TEJUS CONSULTANTS Basaveshwar Nagar Bangalore
Contractor:	Sri.T K SHANKARAPPA (MESPC INFRA PROJECTS PRIVATE LIMITED)

FLAKINESS AND ELONGATION INDICES (IS 2386, PART 1)

Type of Material:	WMM	**Proposed Use**	**WMM**
Sample Location:	At plant	**Date of Sampling**	**18-03-2019**
		Date of Testing	**18-03-2019**

Size of aggregate		Flakiness Index		Elongation Index	
Passing through IS sieve, mm	Retained on IS sieve, mm	Total wt. of aggregate retained on sieves (A) gms.	Wt. of aggregate passing from Flakiness gauge (B) gms	Wt. of aggregate retained on Flakiness gauge (C) gms	Wt. of aggregate retained on Elongation gauge after retained on Flakiness gauge(D)gms
63.0	50.0	0	0	0	0
50.0	40.0	0	0	0	0
40.0	31.5	0	0	0	0
31.5	25.0	0	0	0	0
25.0	20.0	0	0	0	0
20.0	16.0	615	85	530	75
16.0	12.5	1120	115	1005	115
12.5	10.0	770	65	705	55
10.0	6.3	610	50	560	40
Total		**3115**	**315**	**2800**	**285**

Note: Minimum 200 Pcs should be taken on each fraction of test

Flakiness Index(%):	10.11
Elongation Index(%):	10.18
Combined FI+EL (%)	20.29

Consultant's Representative

TEJUS CONSULTANTS

TEJUS
CONSULTANTS

Project	Improvements to Roads and Drains in Agrahara, Agrahara Layout And Surrounding Area in Ward no 5.
Client	Bruhat Bengaluru Mahanagara Palike
Consultant	TEJUS CONSULTANTS Basaveshwar Nagar Bangalore
Contractor	Sri.T K SHANKARAPPA (MESPC INFRA PROJECTS PRIVATE LIMITED)

AGGREGATE IMPACT VALUE
(IS: 2386 Part - 4)

Proposed Use	WMM	Date of Sampling	18-03-2019
Sample Location	At plant	Date of Testing	18-03-2019

Sl. No.	Description		Test No. 1	Test No. 2	Test No. 3	Spec Limit (%)
1	Wt. of stone pieces (dry) passing IS Sieve 12.5mm but retained in IS sieve 10mm (gm)	(Wa)	398.00	387.00	396.00	
2	Wt. of the fraction retained in IS sieve 2.36mm after the impact test (gm)	(Wb)	314.00	300.00	305.00	
3	Wt. of the fraction passed in IS sieve 2.36mm after the impact test (gm)	(Wc)	84.00	87.00	91.00	
4	Aggregate Impact Value (%)	(Wc/Wa)*100	21.11	22.48	22.98	
5	Average Aggregate impact value	(%)	22.19			Max - 30 %

Remarks: ✓ Satisfactory / Not Satisfactory

Consultant's Representative

TEJUS CONSULTANTS

TEJUS
CONSULTANTS

Project:	Improvements to Roads and Drains in Agrahara, Agrahara Layout And Surrounding Area in Ward no 5.
Client:	Bruhat Bengaluru Mahanagara Palike
Consultant:	TEJUS CONSULTANTS Basaveshwar Nagar Bangalore
Contractor:	Sri.T K SHANKARAPPA (MESPC INFRA PROJECTS PRIVATE LIMITED)

FLAKINESS AND ELONGATION INDICES (IS 2386, PART 1)

Type of Material	WMM	**Proposed Use**	**WMM**
Sample Location	At plant	**Date of Sampling**	**19-03-2019**
		Date of Testing	**19-03-2019**

Size of aggregate		Flakiness Index		Elongation Index	
Passing through IS sieve, mm	Retained on IS sieve, mm	**Total wt. of aggregate retained on sieves (A) gms.**	**Wt. of aggregate passing from Flakiness gauge (B) gms**	**Wt. of aggregate retained on Flakiness gauge (C) gms**	**Wt. of aggregate retained on Elongation gauge after retained on Flakiness gauge(D)gms**
63.0	50.0	0	0	0	0
50.0	40.0	0	0	0	0
40.0	31.5	0	0	0	0
31.5	25.0	0	0	0	0
25.0	20.0	0	0	0	0
20.0	16.0	611	85	526	74
16.0	12.5	1124	121	1003	110
12.5	10.0	776	65	711	65
10.0	6.3	616	51	565	41
Total		**3127**	**322**	**2805**	**290**

Note: Minimum 200 Pcs should be taken on each fraction of test

Flakiness Index(%):	10.30	
Elongation Index(%):	10.34	
Combined FI+EL (%)	20.64	

Consultant's Representative

TEJUS CONSULTANTS

TEJUS
CONSULTANTS

Project	**Improvements to Roads and Drains in Agrahara, Agrahara Layout And Surrounding Area in Ward no 5.**
Client	**Bruhat Bengaluru Mahanagara Palike**
Consultant	**TEJUS CONSULTANTS Basaveshwar Nagar Bangalore**
Contractor	**Sri.T K SHANKARAPPA (MESPC INFRA PROJECTS PRIVATE LIMITED)**

Field Dry Density test by Sand Replacement Method (As per IS 2720 (Part 28)

	Date:	**19-03-2019**
Layer no. or level	WMM I layer	
Depth of hole	250mm	

	1	2
Field density:		
Wt. of wet material from hole (Ww) gms.	6195	6254
Wt. of sand+cylinder before pouring (w1) gms.	14000	14000
Wt. of sand+cylinder after pouring (w2) gms.	9718	9712
Wt. of sand in cone (w3) gms.	855	850
Wt. of sand in hole (w4)=(w1-w2-w3) gms.	3427	3438
Bulk density of sand (ys)gm/cc	1.30	1.30
Bulk density of material(i.e. wt. of the wet material) (yb)=(Ww/w4*(ys))gm/cc	2.35	2.36
Moisture meter reading(moisture content)	12.20	12.20
Result:		
Field dry density (yd)=(100*yb/100+mc)gm/cc	2.09	2.11
MDD	2.14	2.14
OMC	13.50%	13.50%
% compaction obtained	97.87	98.49
% compaction required	98%	98%

Consultant's Representative

TEJUS
CONSULTANTS

Name of Work	:	Improvements to Roads and Drains in Agrahara, Agrahara Layout And Surrounding Area in Ward no 5.
Client	:	Bruhat Bengaluru Mahanagara Palike
Consultant	:	TEJUS CONSULTANTS Basaveshwar Nagar Bangalore
Contractor	:	Sri.T K SHANKARAPPA (MESPC INFRA PROJECTS PRIVATE LIMITED)
Date of Testing	:	19-03-2019
Type of Mix	:	WMM
Sample ID	:	WMM 6

GRADATION FOR WMM
(As per MORT&H 400-11)

Sample Location:	At plant	**Date of Sampling:**	19-03-2019
		Date of testing:	19-03-2019
Type of material & Purpose:	WMM	**Oven Dry Wt.(gms):**	10000.0

IS Sieve size in mm	Weight retained	Cummulative weight retained (gm)	Cummulative % of retained	Cummulative % of passing	Specification limits
53	0	0	0.00	100.00	100.00
45	350	350	3.50	96.50	95-100
22.4	2600	2950	29.50	70.50	60-80
11.2	2500	5450	54.50	45.50	40-60
4.75	1500.0	6950	69.50	30.50	25-40
2.36	950.0	7900	79.00	21.00	15-30
0.6	715.0	8615	86.15	13.85	8.0-22.0
0.075	675.0	9290	92.90	7.10	0-8
Pan	710.0	10000			
Total	10000.0				

Consultant's Representative

TEJUS CONSULTANTS

TEJUS
CONSULTANTS

Name of Work	:	Improvements to Roads and Drains in Agrahara, Agrahara Layout And Surrounding Area in Ward no 5.
Client	:	Bruhat Bengaluru Mahanagara Palike
Consultant	:	TEJUS CONSULTANTS Basaveshwar Nagar Bangalore
Contractor	:	Sri.T K SHANKARAPPA (MESPC INFRA PROJECTS PRIVATE LIMITED)
Date of Testing	:	19-03-2019
Type of Mix	:	WMM
Sample ID	:	WMM 3

GRADATION FOR WMM
(As per MORT&H 400-11)

Sample Location:	At plant	**Date of Sampling:**	19-03-2019
		Date of testing:	19-03-2019
Type of material & Purpose:	WMM	**Oven Dry Wt.(gms):**	10000.0

IS Sieve size in mm	Weight retained	Cummulative weight retained (gm)	Cummulative % of retained	Cummulative % of passing	Specification limits
53	0	0	0.00	100.00	100.00
45	360	360	3.60	96.40	95-100
22.4	2620	2980	29.80	70.20	60-80
11.2	2553	5533	55.33	44.67	40-60
4.75	1555.0	7088	70.88	29.12	25-40
2.36	956.0	8044	80.44	19.56	15-30
0.6	720.0	8764	87.64	12.36	8.0-22.0
0.075	675.0	9439	94.39	5.61	0-8
Pan	561.0	10000			
Total	10000.0				

Consultant's Representative

TEJUS CONSULTANTS

TEJUS
CONSULTANTS

Project	Improvements to Roads and Drains Kogilu Layout And Surrounding Area in Ward no 5.	
Client	Bruhat Bengaluru Mahanagara Palike	
Consultant	TEJUS CONSULTANTS Basaveshwar Nagar Bangalore	
Contractor	Sri.T K SHANKARAPPA (MESPC INFRA PROJECTS PRIVATE LIMITED)	
Field Dry Density test by Sand Replacement Method (As per IS 2720 (Part 28)		
	Date:	20-03-2019
Layer no. or level	WMM I layer	
Depth of hole	250mm	
Field density:	1	2
Wt. of wet material from hole (Ww) gms.	6158	6245
Wt. of sand+cylinder before pouring (w1) gms.	14000	14000
Wt. of sand+cylinder after pouring (w2) gms.	9715	9725
Wt. of sand in cone (w3) gms.	855	850
Wt. of sand in hole (w4)=(w1-w2-w3) gms.	3430	3425
Bulk density of sand (γs)gm/cc	1.32	1.3
Bulk density of material(i.e. wt. of the wet material) (γb)=(Ww/w4*γs)gm/cc	2.37	2.37
Moisture meter reading(moisture content)	12.20	12.20
Result:		
FDD(Wt.of the dry material)=(100γb/100+mc)gm/cc	2.11	2.11
MDD	2.14	2.14
OMC	13.50%	13.50%
% compaction obtained	98.70	98.72
% compaction required	98%	98%

Consultant's Representative

TEJUS CONSULTANTS

TEJUS
CONSULTANTS

Name of Work	:	Improvements to Roads and Drains Kogilu Layout And Surrounding Area in Ward no 5.
Client	:	Bruhat Bengaluru Mahanagara Palike
Consultant	:	TEJUS CONSULTANTS Basaveshwar Nagar Bangalore
Contractor	:	Sri.T K SHANKARAPPA (MESPC INFRA PROJECTS PRIVATE LIMITED)
Date of Testing	:	20-03-2019
Type of Mix	:	WMM
Sample ID	:	WMM 1

GRADATION FOR WMM
(As per MORT&H 400-11)

Sample Location:	At plant	**Date of Sampling:**	20-03-2019
		Date of testing:	20-03-2019
Type of material & Purpose:	WMM	**Oven Dry Wt.(gms):**	10000.0

IS Sieve size in mm	Weight retained	Cummulative weight retained (gm)	Cummulative % of retained	Cummulative % of passing	Specification limits
53	0	0	0.00	100.00	100.00
45	352	352	3.52	96.48	95-100
22.4	2605	2957	29.57	70.43	60-80
11.2	2515	5472	54.72	45.28	40-60
4.75	1521.0	6993	69.93	30.07	25-40
2.36	945.0	7938	79.38	20.62	15-30
0.6	714.0	8652	86.52	13.48	8.0-22.0
0.075	675.0	9327	93.27	6.73	0-8
Pan	673.0	10000			
Total	10000.0				

Consultant's Representative

TEJUS
CONSULTANTS

Project	Improvements to Roads and Drains Kogilu Layout And Surrounding Area in Ward no 5.
Client	Bruhat Bengaluru Mahanagara Palike
Consultant	TEJUS CONSULTANTS Basaveshwar Nagar Bangalore
Contractor	Sri.T K SHANKARAPPA (MESPC INFRA PROJECTS PRIVATE LIMITED)

FLAKINESS AND ELONGATION INDICES (IS 2386, PART 1)

Type of Material	WMM	**Proposed Use**	**WMM**
Sample Location	At plant	**Date of Sampling**	**20-03-2019**
		Date of Testing	**20-03-2019**

Size of aggregate		Flakiness Index		Elongation Index	
Passing through IS sieve, mm	Retained on IS sieve, mm	Total wt. of aggregate retained on sieves (A) gms.	Wt. of aggregate passing from Flakiness gauge (B) gms	Wt. of aggregate retained on Flakiness gauge (C) gms	Wt. of aggregate retained on Elongation gauge after retained on Flakiness gauge(D)gms
63.0	50.0	0	0	0	0
50.0	40.0	0	0	0	0
40.0	31.5	0	0	0	0
31.5	25.0	0	0	0	0
25.0	20.0	0	0	0	0
20.0	16.0	613	74	539	70
16.0	12.5	1123	122	1001	110
12.5	10.0	772	58	714	61
10.0	6.3	620	63	557	40
Total		**3128**	**317**	**2811**	**281**

Note: Minimum 200 Pcs should be taken on each fraction of test

		Flakiness Index(%):	10.13		
		Elongation Index(%):	10.00		
		Combined FI+EL (%)	20.13		

Consultant's Representative

TEJUS CONSULTANTS

TEJUS
CONSULTANTS

Project	Improvements to Roads and Drains Kogilu Layout And Surrounding Area in Ward no 5.
Client	Bruhat Bengaluru Mahanagara Palike
Consultant	TEJUS CONSULTANTS Basaveshwar Nagar Bangalore
Contractor	Sri.T K SHANKARAPPA (MESPC INFRA PROJECTS PRIVATE LIMITED)

AGGREGATE IMPACT VALUE
(IS: 2386 Part - 4)

Proposed Use	WMM	**Date of Sampling**	**20-03-2019**
Sample Location	**At plant**	**Date of Testing**	**20-03-2019**

Sl.No.	Description		Test No. 1	Test No. 2	Test No. 3	Spec Limit (%)
1	Wt. of stone pieces (dry) passing IS Sieve 12.5mm but retained in IS sieve 10mm (gm)	(Wa)	398.00	387.00	396.00	
2	Wt. of the fraction retained in IS sieve 2.36mm after the impact test (gm)	(Wb)	314.00	300.00	305.00	
3	Wt. of the fraction passed in IS sieve 2.36mm after the impact test (gm)	(Wc)	84.00	87.00	91.00	
4	Aggregate Impact Value (%)	(Wc/Wa)*100	21.11	22.48	22.98	
5	Average Aggregate impact value	(%)	22.19			Max - 30 %

Remarks : Satisfactory / Not Satisfactory

Consultant's Representative

TEJUS CONSULTANTS

TEJUS
CONSULTANTS

Project	Improvements to Roads and Drains Kogilu Layout And Surrounding Area in Ward no 5.	
Client	Bruhat Bengaluru Mahanagara Palike	
Consultant	TEJUS CONSULTANTS Basaveshwar Nagar Bangalore	
Contractor	Sri.T K SHANKARAPPA (MESPC INFRA PROJECTS PRIVATE LIMITED)	
Field Dry Density test by Sand Replacement Method (As per IS 2720 (Part 28)		
	Date:	20-03-2019
Layer no. or level	WMM I layer	
Depth of hole	250mm	
Field density:	1	2
Wt. of wet material from hole (Ww) gms.	6252	6197
Wt. of sand+cylinder before pouring (w1) gms.	14000	14000
Wt. of sand+cylinder after pouring (w2) gms.	9720	9743
Wt. of sand in cone (w3) gms.	835	842
Wt. of sand in hole (w4)=(w1-w2-w3) gms.	3445	3415
Bulk density of sand (γs)gm/cc	1.3	1.3
Bulk density of material(i.e. wt. of the wet material) (γb)=(Ww/w4*(γs))gm/cc	2.36	2.36
Moisture meter reading(moisture content)	12.10	12.10
Result		
FDD(Wt.of the dry material)=(100γb/100+mc)gm/cc	2.10	2.10
MDD	2.14	2.14
OMC	13.50%	13.50%
% compaction obtained	98.35	98.34
% compaction required	98%	98%

Consultant's Representative

TEJUS
CONSULTANTS

Name of Work	:	Improvements to Roads and Drains Kogilu Layout And Surrounding Area in Ward no 5.
Client	:	Bruhat Bengaluru Mahanagara Palike
Consultant	:	TEJUS CONSULTANTS Basaveshwar Nagar Bangalore
Contractor	:	Sri.T K SHANKARAPPA (MESPC INFRA PROJECTS PRIVATE LIMITED)
Date of Testing	:	21-03-2019
Type of Mix	:	WMM
Sample ID	:	WMM 2

GRADATION FOR WMM
(As per MORT&H 400-11)

Sample Location:	At plant	**Date of Sampling:**	21-03-2019
		Date of testing:	21-03-2019
Type of material & Purpose:	WMM	**Oven Dry Wt.(gms):**	10000.0

IS Sieve size in mm	Weight retained	Cummulative weight retained (gm)	Cummulative % of retained	Cummulative % of passing	Specification limits
53	0	0	0.00	100.00	100.00
45	345	345	3.45	96.55	95-100
22.4	2610	2955	29.55	70.45	60-80
11.2	2530	5485	54.85	45.15	40-60
4.75	1555.0	7040	70.40	29.60	25-40
2.36	965.0	8005	80.05	19.95	15-30
0.6	720.0	8725	87.25	12.75	8.0-22.0
0.075	670.0	9395	93.95	6.05	0-8
Pan	605.0	10000			
Total	10000.0				

Consultant's Representative

TEJUS CONSULTANTS

TEJUS
CONSULTANTS

Project	Improvements to Roads and Drains Kogilu Layout And Surrounding Area in Ward no 5.
Client	Bruhat Bengaluru Mahanagara Palike
Consultant	TEJUS CONSULTANTS Basaveshwar Nagar Bangalore
Contractor	Sri.T K SHANKARAPPA (MESPC INFRA PROJECTS PRIVATE LIMITED)

FLAKINESS AND ELONGATION INDICES (IS 2386, PART 1)

Type of Material	WMM	**Proposed Use**	**WMM**
Sample Location	At plant	**Date of Sampling**	**21-03-2019**
		Date of Testing	**21-03-2019**

Size of aggregate		**Flakiness Index**		**Elongation Index**	
Passing through IS sieve, mm	**Retained on IS sieve, mm**	**Total wt. of aggregate retained on sieves (A) gms.**	**Wt. of aggregate passing from Flakiness gauge (B) gms**	**Wt. of aggregate retained on Flakiness gauge (C) gms**	**Wt. of aggregate retained on Elongation gauge after retained on Flakiness gauge(D)gms**
63.0	50.0	0	0	0	0
50.0	40.0	0	0	0	0
40.0	31.5	0	0	0	0
31.5	25.0	0	0	0	0
25.0	20.0	0	0	0	0
20.0	16.0	615	85	530	75
16.0	12.5	1120	115	1005	115
12.5	10.0	770	65	705	55
10.0	6.3	610	50	560	40
Total		**3115**	**315**	**2800**	**285**

Note: Minimum 200 Pcs should be taken on each fraction of test

		Flakiness Index(%):	10.11		
		Elongation Index(%):	10.18		
		Combined FI+EL (%)	20.29		

Consultant's Representative

TEJUS CONSULTANTS